

REMARKS

Claims 1-14 are pending in this application, with claims 10-13 having been withdrawn from further consideration pursuant to 37 C.F.R. § 1.142(b). Claims 1, 2 and 9 have been amended by the present Amendment. Amended claims 1, 2 and 9 do not introduce any new subject matter.

DRAWING CHANGES

The Examiner has objected to the drawings because it is not clear whether that which is shown in Figs. 4a-4d and 6a-6d is contrast ratio or luminance as a function of viewing angle, since the specification indicates that the Figs. 4a-4d and 6a-6d show the "luminance as a function of view angle," but the graphs are labeled "contrast ratio" versus "view angle."

Further, the Examiner also objects to Fig. 9 because "the axes of the graph are not labeled, and because the legend does not show which line is the 0 voltage."

In response to the Examiner's objections, Applicants propose to amend Figs. 4a-4d and 6a-6d by changing the labels of the vertical axis of the graphs from "Contrast Ratio" to --Luminance--, as designated in the attached drawing sheets. These changes are supported by the specification at page 12, lines 7-9 and at page 13, lines 9-13.

Applicants also propose to amend Figs. 4b, 4d, 6b, and 6d by changing the range of values on the vertical axis of Figs. 4b, 4d, 6b, and 6d, as designated in the attached drawing sheets. These changes are supported by the specification at page 12, lines 10-17 and page 13, lines 9-16. Further, the originally filed drawings are inconsistent with the drawings in the priority document (Korean Patent Application No. 2000-0067391) and the changes to the values on the vertical axis of Figs. 4b, 4d, 6b,

and 6d are being made to correct those inconsistencies. The priority document was filed with the application on November 14, 2001.

Applicants also propose to amend Figs. 7a-7d, 10a-10d and 11a-11d by changing the range of values on the vertical axis of Figs. 7a-7d, 10a-10d and 11a-11d, as designated in the attached drawing sheets. These changes are supported by the specification at page 13, lines 11-16, and page 15, lines 1-6. Further, the originally filed drawings are inconsistent with the drawings in the priority document and the changes to the values on the vertical axis of Figs. 7a-7d, 10a-10d and 11a-11d are being made to correct those inconsistencies.

Lastly, Applicants propose to amend Fig. 9 by changing the range of values on the vertical axis, inserting the label --Contrast Ratio at First Gray V/Contrast Ratio at 0 V-- on the vertical axis, inserting the label --Viewing Angle-- on the horizontal axis, and changing the legend, as designated in the attached drawing sheet. These changes are supported by the specification at page 11, lines 7-17, page 13, lines 20-22, and page 14, lines 1-3. Further, the originally filed drawings are inconsistent with the drawings in the priority document and the changes to Fig. 9 are being made to correct those inconsistencies.

As can be seen from the changes to Fig. 9, and with reference to the specification at page 11, lines 9-12 and page 13, lines 20-22, it can be understood that the graph shows the relationship between contrast ratio an applied first gray voltage and contrast ratio at 0 volts. Accordingly, the horizontal scale line of 1.0 (showing a ratio of 1:1) represents the contrast ratio when the applied first gray voltage is 0 volts.

The changes to Figs. 4a-4d, 6a-6d, 7a-7d, 9, 10a-10d and 11a-11d do not

constitute new matter as there is support for same in the specification and in the priority document.

Accordingly Applicants request that the Examiner withdraw the objections to the drawings and accept the proposed drawing amendments.

OBJECTIONS TO THE CLAIMS

The Examiner has objected to claim 1 because claim 1, at lines 4 and 5, recites "surfaces", when "there is only one inner surface." Accordingly, the Examiner suggests replacing "surfaces" with --surface--. In addition, the Examiner suggests replacing "withing" with --within-- in line 8 and "angle" with --angles-- for correct spelling and grammar.

In accordance with the Examiner's request, Applicants have amended claim 1 to replace "surfaces" and "withing" with --surface-- and --within--, and to delete the phrase "in viewing angle". Therefore, Applicants respectfully request that the Examiner withdraw the objection to claim 1.

REJECTIONS UNDER 35 U.S.C. § 112

Reconsideration is respectfully requested of the rejection of claims 1-8 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The test for enablement is whether one skilled in the art could, at the time of the invention, make and use the claimed invention based on the disclosure and the information known in the art without undue experimentation. Applicants maintain that the claimed invention satisfies the test for enablement.

Briefly, claim 1, as amended herein, states that a voltage value of a first gray representing the darkest state applied between the pixel electrode and the common electrode is within a voltage range for yielding a quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero.

Applicants have amended claim 1 to recite a voltage range for the first gray voltage that is determined based on a relationship between the contrast ratio at an applied first gray voltage and the contrast ratio at 0 volts, as described and depicted in the specification at page 11, lines 9-12 and page 13, line 20 to page 14, line 3, and in amended Fig 9. based on the specification and priority document. As disclosed in the specification and shown in Fig. 9, a specific voltage range for the first gray voltage (i.e., less than or equal to 1.4V) gives a result of a comparison between contrast ratio at a first gray voltage and contrast ratio at 0 V that is greater than or equal to about 0.8. This feature is recited in amended claim 1.

Accordingly, Applicants submit that the amendment to claim 1 does not add new matter to the application because the specification provides an enabled description of the limitations recited therein. For at least the reason that claims 2-8 depend from amended claim 1, which Applicants submit satisfies the enablement requirement, Applicants respectfully submit that the rejection of claims 2-8 for lack of enablement be withdrawn. Applicants, therefore, respectfully request that the Examiner withdraw the rejection of claims 1-8 under 35 U.S.C. § 112, first paragraph.

Reconsideration is respectfully requested of the rejection of claims 9 and 14

under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

With respect to claim 9, the Examiner states that "in concert with the specification and figures, that one of the substrates has pixel electrodes thereon."

Applicants have amended claim 9 to clarify the claimed subject matter by replacing "common" with --pixel-- in line 4. As amended, claim 9 states that a pixel electrode is disposed on the inner surface of the first panel and a common electrode is disposed on the inner surface of the second panel. This feature is clearly described and depicted in the specification and drawings. As a result of this amendment, the limitation "the pixel electrode" in line 7 of claim 9 now has antecedent basis.

Therefore, in light of the amendment to claim 9, Applicants respectfully submit that claim 9 and claim 14 dependent thereon are not indefinite.

As such, Applicants respectfully request that the Examiner withdraw the rejection of claims 9 and 14 under 35 U.S.C. § 112, second paragraph.

REJECTIONS UNDER 35 U.S.C. § 102

Reconsideration is respectfully requested of the rejection of claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,298,199 ("Hirose").

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); M.P.E.P. § 2131.

Applicants respectfully submit that Hirose does not expressly or inherently disclose a voltage value of a first gray representing the darkest state applied between the pixel electrode and the common electrode is within a voltage range for yielding a quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero, as recited in amended claim 1.

Hirose relates to a biaxial optical anisotropy device and does not disclose a voltage range for the first gray voltage, for all viewing angles, that is determined based on a relationship between the contrast ratio at an applied first gray voltage and the contrast ratio at 0 volts, as recited in amended claim 1. Indeed, Hirose contains no suggestion regarding the voltage range of the first gray, and is not concerned with viewing angle. In FIG. 2, Hirose shows only a reformed voltage-transmission curve. In contrast, claim 1 recites a voltage range for the first gray based on contrast ratio at every viewing angle.

Therefore, Applicants respectfully submit that claim 1 and claim 2 dependent thereon, are not anticipated by Hirose.

Since Hirose does not expressly or inherently disclose or suggest the voltage range and contrast ratio features recited in claim 1, Applicants respectfully submit that independent claim 1, as amended, is not anticipated by Hirose. Claim 2 depends from claim 1, which, for the reasons stated hereinabove, is submitted not to be anticipated by the cited reference. For at least those very same reasons, claim 2 is also submitted not to be anticipated by the cited reference.

Therefore, Applicants respectfully request that the Examiner withdraw the

rejection of claims 1 and 2 under 35 U.S.C. § 102(b).

Reconsideration is respectfully requested of the rejection of claims 9 and 14 under 35 U.S.C. § 102(e) as (1) being anticipated by U.S. Patent No. 6,407,791 ("Suzuki-1"); (2) being anticipated by U.S. Patent No. 6,573,695 ("Liu"); or (3) being clearly anticipated by U.S. Patent No. 6,256,082 ("Suzuki-2"). In addition, reconsideration is respectfully requested of the rejection of claims 9 and 14 under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent No. 5,309,264 ("Lien") or U.S. Patent No. 5,646,705 ("Higuchi").

Applicants respectfully submit that the cited references do not expressly or inherently disclose a voltage value of a first gray that is equal to or lower than 1.4 V, as recited in amended claim 9.

Suzuki-1, Liu, Suzuki-2, Lien and Higuchi do not contain any disclosure regarding a voltage range for a first gray, as recited in amended claim 9. Therefore, Applicants respectfully submit that claim 9, and claim 14 dependent thereon are not anticipated by the cited references.

Since the cited references do not expressly or inherently disclose or suggest the all the features recited in amended claim 9, Applicants respectfully submit that independent claim 9, is not anticipated by Suzuki-1, Liu, Suzuki-2, Lien or Higuchi. Claim 14 depends from claim 1, which, for the reasons stated hereinabove, is submitted not to be anticipated by the cited references. For at least those very same reasons, claim 14 is also submitted not to be anticipated by the cited references.

Therefore, Applicants respectfully request that the Examiner withdraw the rejections of claims 9 and 14 under 35 U.S.C. §§ 102(a) and (e).

REJECTIONS UNDER 35 U.S.C. § 103(a)

Reconsideration is respectfully requested of the rejection of claims 4-8 under 35 U.S.C. § 103(a) as being unpatentable over Hirose in view of Suzuki-2. Applicants respectfully submit that the amendment to independent claim 1 renders claim 1 and claims 4-8 patentable over the cited references. Further, Applicants respectfully disagree with the Examiner's assertion that the limitation in claim 6 (a voltage value of a first gray that is equal to or lower than 1.4 V) is obvious.

The Amendment To Independent Claim 1 Renders Claim 1 And Claims 4-8 Dependent Thereon Patentable Over The Cited References

Applicants respectfully submit that Hirose, when taken alone or in combination with Suzuki-2, fails to teach or suggest a voltage value of a first gray representing the darkest state applied between the pixel electrode and the common electrode is within a voltage range for yielding a quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero, as recited in the amended claim 1.

As stated above, Hirose does not disclose a voltage range for the first gray voltage, for all viewing angles, that is determined based on a relationship between the contrast ratio at an applied first gray voltage and the contrast ratio at 0 volts. Hirose contains no suggestion regarding the voltage range of the first gray, and is not concerned with viewing angle. The addition of Suzuki-2 does render the claimed feature obvious. Suzuki-2 relates to a structure of a liquid crystal display and makes no mention of voltage range for the first gray that is based on contrast ratio at every viewing angle.

Therefore, it is respectfully submitted that the cited references, when taken alone or in combination, do not disclose or suggest the voltage range and contrast ratio features, as defined in newly amended claim 1. It is respectfully submitted that it would not have been obvious to modify Hirose, in view of Suzuki-2, to develop the embodiment of the invention recited in claim 1.

Therefore, Applicants respectfully submit that the embodiment of the invention as defined in amended claim 1 is patentable over Hirose, in view of Suzuki-2. For at least the reason that claims 4-8 depends from claim 1, claims 4-8 are also submitted to be patentably distinct over the cited references.

**The Voltage Value Of A First Gray That Is Equal To
Or Lower Than 1.4 V Is Not An Obvious Limitation**

In rejecting claim 6, the Examiner maintains that selecting a voltage value for a first gray that is less than or equal to 1.4V is "obvious because it is a matter of determining an optimum process condition by routine experimentation with a limited number of species." Applicants respectfully disagree with the Examiner's assertion.

The voltage value for a first gray was not recognized as a "result-effective variable" by the cited references and, therefore, the claimed voltage range is not obvious. "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." M.P.E.P. § 2144.05 II. B.; *In re Antoine*, 559 F.2d 618, 195 U.S.P.Q. 6 (C.C.P.A. 1977). A first gray voltage less than or equal to 1.4 V was found to improve contrast ratio and color reproduction in a liquid crystal display at various viewing angles. See, e.g., specification at page 11, lines 9-19. However, neither of the cited

references, when taken alone or in combination, disclose or suggest a functional relationship between a first gray voltage range and improved contrast ratio and color reproduction. Indeed, Hirose does not suggest any limitation regarding voltage range of the first gray and does not mention viewing angles. Further, Suzuki-2 does not disclose or suggest a first gray voltage range, nor its functional relationship to contrast ratio or color reproduction. Therefore, Applicants respectfully submit that the determination of a voltage range of the first gray was not merely "a matter of determining an optimum process condition by routine experimentation" because the voltage of the first gray was not recognized by the cited references as achieving the recognized result of improved contrast ratio and color reproduction. As such, the voltage range limitation recited in claim 6 (and claim 9) is not obvious, and is patentable over the cited references.

Therefore, Applicants respectfully submit that the embodiment of the invention as defined in claim 6 is patentable over Hirose, in view of Suzuki-2.

In light of the above arguments, Applicants respectfully request that the Examiner withdraw the rejection of claims 4-8 under 35 U.S.C. §103(a).

8071-5 (OPP 000681 US)

An early and favorable reconsideration is earnestly solicited. If the Examiner has any further questions or comments, it is suggested that he telephone Applicants' Attorney to reach a prompt disposition of this application.

Respectfully submitted,

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